Art. XIX.—*Additions and Corrections to the Census of Victorian Minerals.*

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[Read 13th December, 1900.]

Introduction.

The following mineral occurrences, with the exception of the meteoric minerals, previously unrecorded, will materially supplement the list of Victorian minerals prepared by Mr. J. A. Atkinson in 1896. The balance of occurrences not included in these two lists will be found in the annual reports of the Department of Mines from the year 1896 and in "An introduction to the study of Mineralogy" by F. M. Krausé, 1896. Advantage has been taken of this opportunity to correct some wrong determinations made in the past, and which might otherwise become perpetnated. I was enabled to do this with the assistance of Professor G. H. F. Ulrich of the Otago University School of Mines and Mr. O. R. Rule, late of the Technological Museum, to whom I am consequently greatly indebted. With regard to some of the old records, although of very doubtful authenticity, it is now difficult or impossible to either verify or disprove them, they must therefore be accepted as correct. A difficulty is also experienced in obtaining exact localities, more especially if specimens have any economic value, and in many instances the information cannot be relied upon, as samples frequently get confused and likewise their localities. Owing to this, some occurrences have been omitted, the information being palpably incorrect. A matter neglected in the past, and which deserves more attention, is the analyses of mineral species. Many minerals can only be determined by such means, and in its absence specimens have to be set aside, relegated to permanent obscurity, or else exhibited under a provisional name, a proceeding eminently undesirable. In this way interesting and perhaps new minerals are lost to science.

At times supposed new species are named and described on the strength of a blow-pipe examination, an analysis evidently being deemed unnecessary. Needless to say this practice is objectionable and it only helps to make confusion where elucidation is desired, creating species out of varieties and mixtures. The method of keeping mineral records is extremely unsatisfactory, if indeed there is any general system in existence. A proper system can only be carried out by the co-operation of the Geological Survey with the various Schools of Mines and Museums, which are the main channels through which mineral specimens pass.

The keeping of a complete record of mineral occurrences should form part of the different officials' duties and who should from time to time forward their information for registration at headquarters. If this were properly done and full and reliable particulars given, it would not only prove of scientific interest but would form a valuable record from an economic point of view. To Messrs. D. Clark and F. Stone my thanks are due for the trouble they have taken in providing me with lists of the various occurrences which have come under their notice, and also to Mr. T. S. Hart for preparing a list of the specimens in the Ballarat School of Mines Museum.

Abbreviations.

B.M.—Specimens in the School of Mines Museum, Ballarat.
M.Dt.—Determinations made in the Mines Department Laboratory and not recorded in the Annual Reports.
Cl.—Determinations made by Mr. D. Clark.
U.—Information received from Professor G. H. F. Ulrich.
R.—Information received from Mr. O. R. Rule.
W.—Determinations made by the writer.
F.—N. Flight. Philos. Trans. Royal Soc., 1882, pp. 887–894.
C.—Prof. E. Cohen. Sitz. K. Preuss, Akad. Wiss. Berlin, 1897.
*—Specimens in the National Museum Collection.
§—Minerals recorded for the first time.

List of Minerals.

Albite.—Soda felspar.

Associated with ankerite in silurian slate, Sulieman Pasha Mine, Ballarat East; associated with ankerite, quartz, pyrite, etc., in silurian slate and sandstone, Band and Albion Mine, Ballarat (B.M.).

Anglesite.—Lead sulphate.

A nodule of galenite with a grey massive crust of anglesite mixed with a little cerussite. Upper Silurian limestone, Lilydale (W.).

Apatite.—Chloro-phosphate of calcium.

Small greenish-yellow hexagonal crystals in a tourmaline granite, hills near Seymour; long hexagonal crystals from the older basalt, Westernport (W.).

Apatite was first noticed in the basalt of Phillip Island, but, owing to the similarity of form, was for some time taken to be Nepheline, and consequently it is recorded as this mineral in some of the earlier catalogues. The correct determination was due to Mr. O. R. Rule.

Arsenopyrite.—Sulp-arsenide of iron.

Small simple crystals enclosed in a clear quartz crystal (endomorph), Blackwood (W.). This mineral has such a general distribution that it is useless attempting to record all its occurrences. It is almost as prevalent as pyrite, and occurs in much the same manner in many of our quartz reefs, and also in some of the auriferous dyke rocks when it appears at times in long fine, prismatic crystals.

Arsenolite.—Arsenic trioxide.

All occurrences are artificial and result from the condensation of arsenic oxide, when arsenical ores (arsenopyrite mostly) are being calcined prior to chlorination.

Asphaltum.—

In small rounded pieces with roughened exterior. Found on the beach of Bullenmerri, near Camperdown.

Augite.—*var.* of pyroxene.

Acicular crystals in a druse of dolerite, Miners' Racecourse, Ballarat (B.M.).

Axinite.*—Boro-silicate of aluminium and calcium with more or less iron and manganese.

Pale lavender-pink coloured crystallizations associated with epidote from small veins in the diorite, Samaria, Mansfield district (M.Dt.).

Barite.—Barium sulphate.

Semi-transparent and imperfectly crystallized masses, Corryong; massive crystalline, Mount Tara (W.).

Large lodes of almost pure barite occur in porphyry, at Gelantipy, they are slightly argentiferous; Clifton Creek and Mount Taylor Creek (Cl.).

Berthierite.*§—Sulphantimonite of iron.

No quantitative analysis of this specimen was made, but in other respects it agrees closely with berthierite. It occurs near Euroa in a quartz lode in small fibrous veins with iridescent surface (W.).

Beudantite.—Hydrous phosphate or arsenate of iron and lead.

The mineral recorded as beudantite is pharmacosiderite, the mistake being due to similarity of form (R.).

Bismuth.—

In small patches in a crystalline quartz reef, Mount Taylor; oxide, sulphide, and carbonate of bismuth, with traces of tellurium, Mallacoota (Cl.).

Bismuthite.—Bismuth carbonate.

Mount Taylor; in ironstone, Mallacoota (Cl.).

Bornite.—Sulphide of copper and iron, Mount Tara (Cl.).

Bournonite.—Sulphantimonite of lead and copper.

Disseminations in quartz with pyrite and arsenopyrite, Mount Wills (W.). Long Tunnel Mine, Walhalla (Cl.).

At Anderson's Creek this mineral occurs in some of the quartz reefs. It is generally surrounded by a yellow powdery decomposition product which, probably consists of lead sulphate and antimony oxide. As far as experience goes bournonite is either non-auriferous, or only auriferous to a slight extent.

Calcite.—Calcium carbonate.

var. Stalagmite.—Granular botryoidal, caves at Yering; banded concretionary; Back Creek, Gippsland (B.M.).

var. Calcsinter.—Loch Ard Caves, near Port Campbell (B.M.).

var. Manganocalcite (?)—Carbonate Gold and Silver Mine, Buchan. Pink in colour, blackens before the blow-pipe, and gives reaction for manganese. Analysis (Cl.):

Lime	49·77
Manganese oxide	4·84
Ferrous oxide	1·00
Magnesia	·25
Carbonic dioxide	43·11
Insoluble residue (Barium sulphate)	·82

Analysis of dark blue, massive limestone from Buchan (Cl.):

Lime	53·34
Magnesia	·48
Water	·32
Iron, alumina, and phosphorus pentoxide	·31
Insoluble residue	·98
Carbonic dioxide and hydrocarbons	43·67
Organic matter (fixed)	·90

The sample gives a disagreeable odour when struck or rubbed and only traces of sulphuretted hydrogen were evolved.

CASSITERITE—Tin dioxide.

Tarago River, South Gippsland; Boggy Creek (Cl.).

Analysis of picked crystals from Mount Taylor Creek (Cl.):

Tin dioxide	94·05
Silica	5·20
Ferric oxide	·75

No tungstic acid present.

CERARGYRITE.§—Silver chloride.

Surface of United Brothers' Mine, Glen Wills; Monte Christo Mine, Bullumwaal (Cl.).

CERUSSITE.—Lead carbonate.

Highland Chief Mine, Brookville (Cl.). With galena and anglesite, Upper Silurian limestone, Lilydale (W.).

CERVANTITE.—Antimony oxide.

Incrusting stibnite in quartz, Burgoyne; massive crust on coarsely crystallized stibnite, Alexandra District; with stibnite, 14 miles from Euroa (W.). Cervantite

usually occurs as a massive or powdery crust on stibnite and no crystals have come under my notice (W.).

CHABAZITE.—Hydrous silicate of aluminium, calcium, sodium and potassium.

Narre Warren (R.).

CHALCOPYRITE.—Sulphide of copper and iron.

Occurs associated with galena in a small quartz vein at Steele's Creek (W.). Mount Tara; Cassilis (Cl.).

The occurrence of chalcopyrite in quartz veins is frequently noticed, more especially in the eastern part of the colony. It is often auriferous and sometimes very rich.

CHIASTOLITE.—*var.* of ANDALUSITE.

Imperfectly formed crystals evenly distributed through a siliceous slate, Thoona. Probably formed by contact metamorphism (W.).

CHROMITE.—Chromium sesquioxide and iron protoxide.

In grains and octahedral crystals, Jack's River, Alberton (W.). Black and massive, Corryong (M.Dt.).

CINNABAR.—Mercury sulphide.

Found in small broken fragments on the surface near a quartz reef, near Bullumwaal, Gippsland (M. Dalton).

COCCOLITE.—*var.* of AUGITE.

The mineral recorded under this name is only common black augite (U.).

COHENITE.—A carbide of iron and nickel.

The physical properties of cohenite and schreibersite are very similar, so that they are not easily distinguishable. They are both less brittle, and their cleavage is not so marked as in other meteorites. Beaconsfield Meteorite (C.) Analysis :—

	1	2	3	4
Iron	—	88·66	91·62	90·94
Nickel	—	3·81	2·24	2·22
Cobalt	—	0·30	0·30	0·30
Carbon	5·51	—	6·59	6·54
Phosphorus	—	1·45	—	—
Residue	16·32	—	—	—

In Nos. 1 and 2 some schreibersite is present. Nos. 3 and 4 are calculated without schreibersite. The specific gravity, 7·2014, appears to be lower than usual, and remains so after allowing for a 13.06 per cent. mixture of schreibersite. See note under taenite.

Columbite.—Columbate and tantalate of iron and manganese.

The mineral recorded as columbite from Maldon, has since been proved, by Mr. Rule, to be a ferriferous variety of Rutile. This error arose through the quantity available being very limited, and the chemical reactions mistaken for those characteristic of columbium, and also from the fact that the crystals were very small, and twinning gave them the appearance of belonging to the orthorhombic, instead of the tetragonal system (U.).

Copiapite.—Hydrous iron sulphate.

Earthy, Bull's Well, Jan Juc (B.M.).

Corundum.—Alumina.

Rolled fragments, some ferruginous and some passing into diaspore, Beechworth (B.M.). In nearly all the creeks as a grey sand, blue sapphires generally occurring with it, the largest measured $\frac{7}{16}$ of an inch across, and is of a navy blue colour, Mitchell River, Boggy Creek, Wentworth, Swift's Creek (Cl.). Rounded fragments of a greenish colour, Garlick's Lead, Trentham (W.). Corundum in all its varieties but the ruby, which is rare, is commonly met with in the water courses in, and alluvial deposits derived from, eruptive and metamorphic rocks. Much of the so-called black corundum is only pleonaste.

Daubréelite.—Sulphide of chromium and iron.

Surrounding some of the nodules of troilite, Cranbourne, No. 1 Meteorite (F.). In the Cranbourne No. 2 Meteorite, two patches of troilite are surrounded by schreibersite, and a black mineral which is probably daubréelite (W.). See note under taenite.

Diamond.—Pure crystallized carbon.

Octahedron of a pale yellow tint, found in a wash containing tourmaline, amethyst, mica, quartz crystals, etc., Cong-

bool, Black Range (W.). The stones found are said to measure about $\frac{3}{8}$ of an inch in diameter. It is also reported that rubies and sapphires were likewise found, but too small to be of value. (See *Argus*, 27th April, 1895).

Dittmarite.—

A very doubtful mineral species (R.).

Dolomite.—Magnesium carbonate.

Small, white, flat rhombohedra with rounded faces, the whole forming a small cavernous mass, from the basalt, Bung Bung* (W.). White nodular masses, Swift's Creek (Cl.).

Edmondsonite.—A meteoric nickel-iron.

This alloy forms thin paper-like pliant plates, which lie on the faces of the tetrahedra of nickel-iron. They are in the form of equilateral triangles, or are lozenge-shaped, and have the thickness of stout writing paper. Fresh plates taken direct from the meteorite contained 0.688 per cent. of phosphorus. Cranbourne No. 1 Meteorite (F.).

Iron - - - - -	70·138
Nickel - - - - -	29·744

See note under taenite.

Electrum.—Alloy of gold and silver.

Granular in quartz, Wood's Point (B.M.).

Epidote.—Silicate of aluminium, calcium and iron.

Small green, imperfect crystals associated with axinite in diorite, Samaria, Mansfield District* (W.). Greenish veins with reddish coloured walls in diorite, Noyang and Charlotte Spur (Cl.).

Fluorite.—Calcium fluoride.

Small veins above the weir, Mitchell River (Cl.).

Galenite.—Lead sulphide.

Large cubical specimens, Gum Forest and Martha Vale near Mt. Baldhead on the Nicholson River (Cl.).

Analysis of galenite from Martha Vale (Cl.):

Lead - - - - -	85·84
Iron - - - - -	·27
Copper - - - -	·18
Silver - - - -	·06
Sulphur - - - -	13·82

Contains slight excess of sulphur which it evolves when heated in closed tube.

GARNET.—*var. Almandine.*

Crystals in the granite of Mount Taylor. The creeks below contain them in large quantities (Cl.).

GÖTHITE.—Hydrous sesquioxide of iron.

Limestone Creek, head of Murray River (Cl.).

GRAPHITE.—Carbon, mostly impure.

Rather earthy; evidently from a small vein, Riddle's Creek (M.Dt.). Coating metamorphic slate, Stawell (B.M.). Occurs surrounding troilite and as independent masses. Cranbourne No. 1 Meteorite (F.); Beaconsfield Meteorite (C.); Cranbourne No. 2 and Langwarrin (W.).

Analysis of Cranbourne No. 1:—

Carbon - - - -	89·661
Hydrogen - - -	0·257
Residue (iron, etc.) - -	10·412

GYPSUM.—Hydrous calcium sulphate.

Pulverulent. Bridgewater on Loddon (B.M.).

var. Selenite (B.M.). A group of crystals with somewhat convex and pitted faces, single crystals of common form plentiful, Sewerage works, Hannah Street, South Melbourne* (W.).

HEMATITE.—Sesquioxide of iron.

var. Micaceous.—Soft and very micaceous, near Mount Wills* (W.).

var. specular.—In hexagonal plates in a druse in basalt with labradorite and calcium carbonate, Batesford, near Geelong (W.).

Tabular crystals with labradorite in dolerite, Redan, Ballarat (B.M.). Specular iron in basalt may be regarded as a primary constituent.

HERSCHELITE.—*var.* of Phacolite.

The occurrences recorded under the name of herschelite should be placed under phacolite, because Victor von Lang, at that time of the British Museum, was misled by insufficient analyses and crystallizations (U.).

HORNBLENDE.—*var.* of Amphibole.

Massive outcrop, Glenmaggie (Cl.).

Kamacite.—See note under taenite.

Kermesite.—Oxysulphide of antimony.

Coating massive stibnite, Tallandoon; fibrous radiating tufts in a druse, with quartz crystals and stibnite from a vein in a quartz reef, United Brothers' Mine, Sunnyside* (W.).

Laumontite.*§—Hydrous silicate of aluminium and calcium.

Partly in small crystals, and otherwise coating a joint in mesozoic sandstone, San Remo (R.).

Lead.—

Rolled pieces from the gold drift, Park Company, Ballarat West (B.M.).

Earthy oxide of.—With wolfram, head of Boggy Creek; in cavities in quartz, Tambo Mine, Deptford (Cl.).

Leucopyrite (?)—Iron arsenide.

Bright tin-white patches in coarse granular quartz, and also in tarnished patches in an iron-stained fine granular quartz, Eldorado (W.).

Without analysis it is impossible to decide definitely whether the iron arsenides are leucopyrite or lollingite, as the variance in composition is the only distinguishing feature. They also closely resemble arsenopyrite, for which mineral they are probably often mistaken. It is more than likely that there is a gradation from lollingite to leucopyrite, and thence by the addition of sulphur into arsenopyrite. Whether, like the latter mineral, they are auriferous, does not appear.

Limonite.—Hydrous sesquioxide of iron.

Pseudomorphous crystals after stilbite (?) and vivianite, Wannon (W.).

Analysis of limonite from the Mallacoota Proprietary Mine (Cl.):

Ferric oxide - - -	41·95
Alumina - - - -	3·25
Water (hyg.) - - -	1·08
Water (combined) - -	6·85
Bismuth - - - -	trace
Insoluble residue - - -	46·30

Gold, 7 ozs. per ton; Silver, 6 dwts. per ton.

Limonite occurs all over the colony, and may be found almost wherever decomposition has taken place, more especially in the areas of basic eruptive rocks and in most outcrops of mineral lodes. It is therefore useless to record occurrences unless they have some special mineralogical or economic interest.

LITHOMARGE.—(Indurated kaolinite).

Of shining porcelain-like appearance, coloured red in part by iron sesquioxide, Maryborough district (W.).

MAGNESITE.—Magnesium carbonate.

Earthy and impure nodules, 14 miles from Euroa (W.).

Vesicular, Will-Will-Rook; with calcite in dolerite, partly coated with hyalite, Ballarat (B.M.).

MAGNETITE.—Iron protoxide and iron sesquioxide.

Large, dull brown, polished grains, Myamyn; Angular and partly rounded fragments, Surrey Hills (W.).

In perfect octahedrons, mixed with other non-metallic sands, Mitchell River (Cl.).

Analysis of Mitchell River magnetite; sample obtained by picking up with a weak magnet (Cl.).

Ferric oxide - - -	79·44
Ferrous oxide - - -	20·25
Magnesia - - - -	trace

MANGANITE.—Hydrous sesquioxide of Manganese.

Laminar, Superb Coy's. Mine, Linton (B.M.).

MARCASITE.—Orthorhombic Iron disulphide.

Nodular with fossil wood, Nelson mine, Sebastopol, Ballarat (B. M.).

MIRABILITE.—Hydrous sodium sulphate.

Efflorescent, earthy, in parts epsomite, Lal Lal (B.M.).

MOLYBDENITE.—Molybdenum disulphide.

Plates in quartz, Gurrum, near Euroa; Lancefield (W.).

MOLYBDITE.—Molybdenum trioxide.

An incrustation on molybdenite from a quartz vein in granite, Gurrum, near Euroa (W.).

MONAZITE.—Phosphate of cerium, lanthanum, didymium and mostly containing also thorium.

Small brown resinous grains in a sand consisting of quartz, wolframite, magnetite, menaccanite, chrysolite(?), felspar and gold, South Gippsland (W.).

Phosphate of Cerium.—Probably monazite. Pinch Swamp Creek, E. Gippsland (Cl.).

Nhill, and in gem sands generally (R.).

This phosphate of cerium, which is common in parts of Gippsland, if not monazite is a closely allied mineral, but it has never been completely analysed, perhaps owing to the difficulty of isolating it.

MULLERITE.—

A very doubtful mineral species (R.).

NEPHELINE.—See note under apatite.

OBSIDIAN.—

This and other glassy forms of rocks should not be included in mineral catalogues.

OLIGOCLASE.—A soda-lime felspar.

Analyses of oligoclase from the basalt, Anakies (M.Dt.). (See Report Aust. Assoc. for Advancement of Science, vol. vii., p. 375).

	No. 1.		No. 2
Silica	62·98	-	62·22
Alumina, Ferric oxide	21·88	-	22·42
Lime	2·78	-	3·34
Magnesia	trace	-	trace
Soda	5·00	-	6·14
Potash	1·90	-	2·30
Unestimated and loss	5·46	-	3·58

OPAL.—Silica with some water.

var. Semiopal.—Massive, Beechworth; with felspathic clay in basalt, Deep Creek (B.M.).

var. Hyalite.—Botryoidal crust in vesicular lava, McDonald's Hill, Smeaton (B.M.).

var. Infusorial earth.—Grey and argillaceous; contains plant remains. Sewerage tunnel near Railway Street, South Yarra* (F. Spry).

Analysis of infusorial earth from Cardigan (B.M.):

Silica	79·89
Alumina	9·95
Ferrous oxide	trace
Magnesia	trace
Lime	trace
Carbonic dioxide	trace
Water at 100°	5·41
Water after ignition	4·78

Orthoclase.—Potash felspar.

Massive lamellar, Anakies; pink twin prisms with quartz in granite, Ovens (B.M.). Massive, dull red, showing cleavage planes, and enclosing small irregular patches of talc, parish of Boweya, County Moira* (W.).

Analysis of large crystals from Mount Taylor (Cl.):

Silica	62·84
Ferric oxide	1·43
Alumina	20·23
Manganese oxide	trace
Lime	·92
Magnesia	·30
Potash	10·09
Soda	3·25
Loss on ignition	1·20

Since no microscopical examination was made it is possible there may have been another felspar included between the laminae.

Paragonite.§—A hydrous soda mica.

Greyish white pearly scales on quartzose rock with pyrite and arsenopyrite, Golden Mountain, Doon (B.M.).

Pharmacosiderite.—Hydrous iron arsenate.

This mineral was not found at Castlemaine (U.).

Phillipsite.—Hydrous silicate of aluminium, calcium and potassium.

Simple twin crystals in a druse in basalt, Flinders (R.).

Pinite.—An alteration product, composition not definite.

Pseudomorphous crystals after iolite, accompanied by quartz and felspar crystals from a cavity in granite, Bradford, near Maldon (J. Hornsby).

Greyish-white matted scales from a quartz reef, Eaglehawk (B.M.).

PLATINUM.—

Some examples examined were reported by Mr. W. Paterson, of the Bank of Victoria, to occur at Turton's Creek, Gippsland, with gold and osmiridium (R.).

PLESSITE.—See note under taenite.

PREHNITE.*—Hydrous silicate of aluminium and calcium.

In removing some calcite from a specimen of axinite from Dookie, by dilute hydrochloric acid, a few white crystals of prehnite were revealed. They are very thin and fragile, with broken outline and faces marked with cross striations. The mineral occurs in diorite, and is associated with axinite, garnet and calcite. A dull green acute angled crystal was likewise noticed, which can probably also be referred to this species. It was surrounded by a fine fibrous amphibole like byssolite (W).

PSILOMELANE.—Composition varied, but mostly manganese oxide.

Veins in silurian slate, McKenzie's Diggings, Goulburn; solid dendrites in a quartz boulder, Chinaman's Flat, Maryborough (B.M.).

Botryoidal forms incrusting quartz, Ararat* (W.).

PYRARGYRITE.§—Sulphantimonite of silver.

Democrat Mine, Glen Wills (Cl.).

PYRITE.—Iron disulphide.

Cubical crystals densely impregnating orthoclase, Ararat; small veins of secondary origin in metamorphic sandstone, Kensington Street Sewer, South Yarra; nodule of radiated structure from decomposed granite, William Street Sewer, South Yarra (W.).

Pyrite is so widely distributed that no record has been kept of its occurrence in quartz reefs. It may almost be said that where these are found, so also will pyrite be found in more or less quantity, and even in quartz which has every appearance of being quite pure, this mineral will reveal itself in many instances after

crushing and washing. The reefs which do not contain it are also probably devoid of the precious metal. Auriferous dyke rocks are invariably pyritic, and in the county rock adjacent to them and to many quartz reefs, the mineral is also developed. Secondary pyrite is mostly non-auriferous, and, as far as can be ascertained, never contains gold in payable quantity.

PYROLUSITE.—Manganese dioxide.

Buchan River (Cl.).

PYROPHYLLITE.—Hydrous silicate of aluminium.

Scaly, rich in lithia, Egerton (B.M.).

PYRRHOTITE.—An iron sulphide.

Massive, Thomson River; in diorite, Buldah Creek, East Gippsland (Cl.).

QUARTZ.*—Silica.

Massive, green and crystalline; the colour is perhaps due to the presence of chlorite. One mile south-east of Tangil (W.).

var. Chalcedony.—Grey in colour and of fine botryoidal structure on porous limonite, Granite Flat, Snowy Creek (W.). Banded, Mount Cudgewa, Upper Murray. From a cross course at a depth of 5 feet, Mount Blackwood (B.M.).

Agate.—Banded with crystalline growth, Yandoit (B.M.).

Basanite.—Rolled fragment, Ovens River (B.M.). In most drifts all over the colony (R.).

Flint.—Nodular concretion, Loutit Bay (B.M.).

Jasper.—Massive in Upper Silurian, Mount Cooper (B.M.).

RHABDITE.—A phosphide of iron and nickel.

This mineral occurs plentifully in the meteorites forming nearly one per cent. of the mass of the nickel-iron in the Cranbourne No. 1, Cranbourne No. 1 Meteorite (F.). Beaconsfield Meteorite (C.). Analysis :—

	Cranbourne No. 1.	Beaconsfield.
Iron	38·242	(diff.) [45·54]
Nickel	49·335	42·62
Cobalt	—	[0·80]
Phosphorus	12·950	15·05

Specific gravity—6·33 to 6·78.

The analysis of Cranbourne No. 1 is the mean of three analysis. The iron and cobalt analysis in the Beaconsfield failed, but cobalt was estimated at 0.80.

See also note under taenite.

RUBELLAN.—An alteration product.

Hexagonal reddish plates derived from the decomposition of olivine by hydration and oxidation of the iron. The specimen is in the form of a volcanic bomb, Mount Leura (W.).

SCHREIBERSITE.—Phosphide of Iron and Nickel.

Occurs as an irregular envelope round the troilite patches or nodules, and also as independent cystals through the nickel-iron. It is between tin and silver-white in colour, and its specific gravity is about 7·17. It can be obtained as a coarse insoluble powder by treating the crude nickel iron with hydrochloric acid till all action ceases. It is magnetic, and dissolves readily in nitric acid.

Beaconsfield meteorite (C.); Cranbourne No. 1 Meteorite (F.); Cranbourne No. 2 and Langwarrin Meteorites (W.).

Analysis:

	Cranbourne No. 1	Beaconsfield
Iron	56·245	66·92
Nickel	29·176	18·16
Cobalt	—	0·62
Phosphorus	13·505	14·88

In searching through the debris of the Cranbourne No 1, two other phosphides were discovered. One, a large brass-coloured oblique crystal, gave on analysis the following results:—

	No. 1.	No. 2.
Iron	69·251	69·843
Nickel[1]	—	—
Phosphorus	15·420	16·666

The other phosphide consisted of crystals apparently in the form of square prisms, which, while the sides were quite

[1] Both determinations lost.

bright and metallic, had a square centre of a dull, almost black, colour.

Analyses:

Iron - - - -	67·480
Nickel - - - -	20·318
Phosphorus - - -	12·317

Schrötterite.§*—Hydrous aluminium silicate.

Blue semi-transparent veins traversing a milky white amorphous aluminium silicate. The veins are very opal-like in their appearance, and the colour, which is rather bright in the centre becomes almost lost towards the sides. The specimen was obtained from the Government track between Bright and Wood's Point (W.).

Scorodite.—Hydrous ferric arsenate.

An earthy crust on arsenopyrite in a quartz gangue, 14 miles from Euroa; minute green crystals in a ferriferous drusy quartz from a reef two feet wide, Benalla (W.).

Siderite.—Iron protocarbonate.

Massive, argillaceous and calcareous, coloured with carbonaceous matter, Morwell (W.).

var. Sphaerosiderite.—Small, almost perfect spheres of a dirty brownish yellow colour on basalt, Garlick's Lead, Trentham* (W.). Nearly wholly decomposed to hydrous oxide of iron, Ceres, near Learmonth (B.M.).

Silver.—

A sulphide associated with pyrite in quartz, Gelantipy (Cl.).

Sphalerite.—Zinc sulphide.

Vein at Mount Tara; crystals of metallic grey colour, Cassilis (Cl.).

Analysis of sphalerite from Cassilis (Cl.):

Zinc - - - -	63·29
Iron - - - -	4·61
Sulphur - - - -	29·88
Insoluble - - - -	·15

Sphene.—Titanium and calcium silicate.

Tarago River, South Gippsland (Cl.).

Spinel.—Alumina and magnesia.

var. Ruby Spinel.—Both determinations of this mineral are wrong, and, to my knowledge, it has never been identified in Victoria (U.).

var. Pleonaste.—This common black variety occurs in many of our alluvial deposits, and is frequently mistaken for cassiterite. It can easily be distinguished by its vitreous lustre, conchoidal fracture and superior hardness.

Stibnite.—Antimony sulphide.

United Brothers' Mine and Democratic Mine, Glen Wills (Cl.).

Scrubby Creek, Mitta Mitta; Mulgrave; Eildon, Goulburn River; with antimony oxide, Burgoyne; with kermesite, Tallandoon; Toombullup; Little River, Wodonga; Steel's Creek; a vein two to three inches wide, the casing shows gold, one mile east of Dunolly (M.Dt.); with antimony oxide, 14 miles from Euroa (W.).

Stilbite.—Hydrous silicate of aluminium, calcium and sodium.

Small sheaf-like groups of clear crystals from druses in the older basalt, Westernport (W.). Small crystals associated with calcite from a joint in mesozoic sandstone, San Remo (R.).

Taenite.—A meteoric nickel-iron.

On decomposition and disintegration taenite lamellae may be separated in quantity from the resulting fine material. The highest specific gravity obtained was 7·1754 which is low for an alloy so rich in nickel. Analysis:

	No. 1.	No. 2.
Residue - -	3·07	—
Iron (diff.) -	49·38	- 50·92
Nickel - -	46·39	- 47·98
Cobalt - -	0·61	- 0·63
Carbon - -	0·45	- 0·47
Phosphorus -	0·10	—

No. 2, after deducting the phosphor-iron-nickel (3·73%). Beaconsfield meteorite (C.). In addition to taenite other nickel-iron alloys are common to metallic meteorites such as plessite and kamacite. Although only one

occurrence may be given, as in this instance, it must be understood that, owing to the fact that the various metallic meteorites found in the colony, viz.—The Cranbourne Nos. 1 and 2, the Langwarrin and the Beaconsfield, are undoubtedly fragments of a parent body, their mineral constituents will be identical but perhaps not equally distributed. The want of an exhaustive examination is probably responsible for the apparent absence of them in some of the meteorites (W.).

Talc.—Hydrous magnesium silicate.

Consists of small scales stained with ferric oxide, occurs as a vein six inches wide, Hedi (W.). The record of talc from Heathcote is incorrect, the mineral proved to be talcosite (U.).

Tennantite.§—Sulpharsenite of copper.

The specimen closely resembled tetrahedrite but gave strong reactions for arsenic instead of antimony; it is associated with chalcopyrite in a quartz gangue, Empress Lode, Merry Creek (W.).

An assay of a bulk sample gave as follows (M.Dt.):

Copper, 15·8 per cent.

Gold, 13 dwts. 1 grain per ton.

Silver, 9 ounces 9 dwts. 11 grains per ton.

Tetradymite.§—Bismuth telluride.

Plates with splendent metallic lustre in places showing a light bronze tarnish cleaves easily into laminae, strongly resembles molybdenite; occurs associated with gold in quartz, Maldon Gold Field Coy. The composition of this mineral had been ascertained by Mr. Hiscock from whom the specimen was received (W.).

Tourmaline.—A complex silicate containing boron.

Concentric radiating groups in quartz, Lindenow; in binary granite near Nar-nar-goon (W.). In greisen, Cassilis (Cl.).

Troilite.—Monosulphide of Iron.

Occurs almost entirely as more or less rounded masses, varying in size from half-an-inch to more than two inches in length. They are usually surrounded by schreibersite and graphite, and sometimes by daubrée-

lite. These minerals do not penetrate or mix with it, as in the case of some meteorites. Cranbourne No. 1 Meteorite (F.), Beaconsfield Meteorite (C.), Cranbourne No. 2 and Langwarrin Meteorites (W.).

Analysis :

	Cranbourne No. 1				Beaconsfield	
	1.	2.	3.	4.	1.	2.
Iron	—	62·150	63·613	—	57·49	58·08
Nickel	—	0·446	—	—	4·30	4·34
Cobalt	—	—	—	—	1·50	1·52
Sulphur	36·543	—	36·207	36·250	35·71	36·07
Copper	—	0·079	—	—	—	—
Chlorine	—	0·130	—	—	trace	—
Graphite	—	—	—	—	0·33	—
Insol. residue	0·215	2·297	—	—	—	—

Turquois.—Hydrous phosphate of aluminium with some copper.

Thin veins and incrustations of greenish-blue colour with quartz and slate, Lurg, near Benalla (M.Dt.).

Wolframite.—Iron and manganese tungstate.

Crystals in quartz from the granite of Mount Buffalo; sand in an auriferous wash, foot of Mount Buffalo and Hoddle's Creek; in quartz, Cameron's Creek; tabular plates in quartz, Jenolan River, Mallacoota (W.).

Head of Boggy Creek, Bullumwaal; in wash, Ensay; as a lode intermixed with quartz, Buckwong Creek, Limestone Creek (Cl.).

Analysis of Wolframite from Buckwong Creek (Cl.) :

Tungstic trioxide	75·20
Manganese oxide	5·74
Ferrous oxide	17·63
Insoluble residue (mainly silica)	1·24